

*Telegraphic Communication interfered with by Atmospheric Electricity:* Bismarck, Dak., 7th, line heavily charged.

*Auroras.*—Wood's Holl, Mass., 13th; Thomasville, Ga., 17th; Cambridge, Mass., "aurora regularly looked for every day at 8 p. m.; moonlight at 8 p. m. on the 5th, 6th, 10th, 29th to 31st, some clouds in the north on the 6th to 14th, obscured on the 1st, 2nd, 3rd, 4th, 7th, 8th, 9th, 11th, 15th, 17th, 21st, 22nd, 24th, 27th and 28th, clear but no aurora on 12th, 13th, 16th, 18th, 19th, 20th, 23rd and 25th;" Franklin, N. C., 23rd; Pembina, Dak., 23rd; Ft. Davis, Texas, 19th; Madison, Wis., 28th; Eastport, 1st, 21st and 24th; Boston, 24th.

## OPTICAL PHENOMENA.

*Solar Halos.*—1st, Ia., Mass., Vt., Mich., N. Y., Cal., Dak., Minn., Kan., 2nd, Ia., Mich., Dak., Neb., Minn., Kan., Ill., Ind., Me. 3rd, Ia., Ohio, Conn., Ill., Cal., Minn., Wis., Ga. 4th, Ia., N. J., Tenn., N. C., Neb., Dak., Wis. 5th, Dak., Minn. 6th, Ind., Kan., Vt., Wis., Me., Dak., Kan. 7th, Me., N. C., Ill., Neb., N. Y., Pa., Vt., Dak., Ohio. 8th, Ia., Kan., Neb., Dak., Minn. 9th, Ia., Kan., Dak., Minn. 10th, Ia., Mich., Mo., Cal., Kan., Minn. 11th, Ia., Mass., N. J., Vt., Va., N. Y., Conn. 12th, Ia., Me., Mass., N. Y., Conn., Dak. 13th, Ia., Mass., Neb., Vt., Dak. 14th, Ia., Ill. 15th, Pa. 16th, Kan., Mich., Dak., Tenn. 17th, Ia., Me., Mass., Mich., N. Y., Vt., Conn., Ill., Pa. 18th, Ia., Dak., Neb., Minn. 19th, Vt., Dak. 20th, Me., Ohio, Ill., Wis. 21st, Ia., Me., Mass., N. Y., Ohio, Vt., Fla., Conn., Ill., Utah., Dak. 22nd, Ind., Ohio, Conn., Ill., Mo., Ia. 23rd, Ill., Wis. 24th, Mass., Ohio, N. Y. 25th, Ia., Ohio., Tex. 26th, Ia., N. Y., Utah. 27th, N. C., Mich., Ga. 28th, Ia., N. Y., Ohio, Ga. 29th, Ohio, Vt., N. J., Mich., Neb. Col., Ia., N. Y., Ga. 30th, Ia., Ill., Neb., Ohio. 31st, Ind., Ia.

*Lunar Halos.*—1st, Ia., Me., N. Y., Dak., Ill., Ind., Mass., Mo., Vt., Tex., Ala. Wis., Minn., Ga. 2d, Ia., Ohio, Ill., Conn., Ind., Mich., Tex., Minn. 3d, Kan., N. J., Wis., Ill. N. Y., Conn., Cal., Me., Vt., Nev., Ind. Ty., N. C., Mass. 4th, Mass., N. J., N. C., Ill., N. Y., Conn., Mo., Wis., Minn., Ohio, Tenn., Me., R. I. 5th, Md., N. J., Ill., Tenn., Conn., Me., Mont., Dak., Tex., Minn., Ind. 6th, Ind., Me., Mass., Ohio, Va., Tex., Ill., Ia., Mo., Ind. Ty., La., Wis., Mich., N. Y. 7th, Ia., Me., Md., Mass., N. J., Pa., Va., Neb., Mich., Tenn., N. Y., Conn., Ga., Col., Dak., Minn., Wis., W. Va. 8th, Ohio, Cal., Ill., Nev., Dak., Minn., Wis., Ia., Pa. 9th, Ia., N. Y., Ohio, Neb., Ind., Ind. Ty., Minn. 10th, Ill., Mass., Ohio, Va., Tex., Mich., Tenn., N. C., Conn., W. Va., Dak., Ia., Ga., Md., Ind. 11th, N. Y., Pa., Va., N. C., Mo., Tex., Wis., Ohio. 12th, Conn., Idaho, Tex., Ga., Me. 13th, Nev., Ia., Ga. 14th, Ind., N. Y., Me., Mo. 16th, Neb, 17th, Ind., N. Y. 18th, Ill. 21st, Ill. 24th, Ohio, Ill., Ia. 25th, Ill., Va. 26th, Ia., Mich., Mo., Ala., Tenn. 27th, Tex., Mo., Neb. 28th, N. J., N. Y., Va., Wis., Mo., Neb., Tex., N. M., Ga. 29th, Ind., Kan., Ohio, Va., Mich., Mo., Col., Tex., W. Va., Ga. 30th, Ill., Ind., Neb., Ohio, Ia., Cal., Minn., Wis., Mich., Ga. 31st, Ind., Me., N. J., Ohio, Ia., Mo., Dak., Minn., Tex., La. Me., Vt.

*Mirage.*—Genoa, Neb., 1st, 3rd; Olivet, Dak., 26th, 29th, 30th; New Bedford, Mass., 15th; Pembina, Dak., 28th; Burlington, Vt., 3rd, 5th.

## MISCELLANEOUS PHENOMENA.

**BOTANICAL.**—*California*—Sacramento, 23rd, poplar and other trees in bud. *Florida*—Mayport, 5th, oranges were picked encased in half an inch of ice; fruit uninjured. Houston, 8th, coldest morning for years; young orange trees are injured, but the bearing trees are not hurt; 31st, oats nearly all sown and corn planting commenced. *Georgia*—Forsyth, 29th, alder bushes in full bloom, plum trees beginning to bloom. Augusta, 25th, elm trees budding; 27th, trimming trees about the city, planting English peas and early garden vegetable seeds; 29th, japonicas in full bloom in the open air; 30th, peach trees beginning to bloom. *Indiana*—Green Castle, 23rd, buds of the peach, plum and cherry are generally killed, and the peach trees are largely, if not generally, killed; wheat is in the best condition, having been well protected by the snow. Brookville, 23rd, wheat crop greatly benefitted by the heavy covering of snow; peaches killed, apples not injured. Greensburg, 23rd, wheat crop in fine condition, much benefitted by the snow. Madison, 23rd, peaches all killed, cherries and grapes have suffered much; wheat well preserved and protected. Anderson, 23rd, wheat in splendid condition; fruit generally believed uninjured. Vincennes, 23rd, fruit only slightly damaged; prospect for wheat very promising. Indianapolis, 23rd, wheat in splendid condition, abundant harvest anticipated; peaches all killed and trees somewhat damaged; apples not injured; pears—fruit all killed, trees uninjured; cherries—fruit all killed, trees uninjured; grapes—some tender varieties killed; raspberries all damaged; quinces—fruit all killed and trees badly damaged; blackberries killed to some extent; strawberries in fine condition, being protected by the snow; grass in excellent condition. Shelbyville, 23rd, fruit crop considerably injured, peaches believed destroyed; wheat much benefitted by the snow. Aurora, 22nd, wheat crop good; fruit crop much injured, especially peaches and cherries. Ft. Wayne, 23rd, fruit not as much injured as anticipated; wheat has received no damage. Vevay, 31st, peach trees, most flowering shrubs and hardy hybrid roses are killed; great quantities of potatoes frozen in pits; wheat never looked more promising and thrifty; herbaceous plants have been saved by the covering of snow. *Illinois*—Mt. Carmel, 23rd, grain crop greatly benefitted by the heavy snow, peaches entirely destroyed in some localities; apples not believed to be injured. *Iowa*—Independence, 27th, sap rising in osage orange, horse radish and parsnips sprouting. *Kansas*—Holton, 31st, peach buds in some localities reported killed. *Kentucky*—Nicholasville, 22nd, wheat and grass are uninjured, the average of the former is very large; fruit growers state that there will be no fruit of any kind worth mentioning; young trees of all kinds are dead and many large trees froze and burst; flowers in pits suffered severely. Greenup, 24th, fruit crop

severely injured except in sheltered localities; wheat crop decidedly improved by the heavy snow. *Maysville*, 23rd, in some localities peaches and cherries have been killed by the cold, but generally these fruits have been saved; all other fruits give indications of abundant yields; wheat looks green and fresh and its growth vigorous. *Ashland*, 23rd, amount of wheat sown is small compared to last year, but it is in a flourishing condition. *Harrodsburg*, 24th, fruit buds not injured much; wheat well protected. *Paris*, 23rd, it is generally believed that all crops are not much injured by the snow or cold; in some portions of the Blue Grass region the fruits will all be lost. *Adair Co.*, 14th, the prospect for a good wheat crop very promising. *Woodford Co.*, 13th, wheat crop looking very fine, well protected by the snow. *Grayson Co.*, 15th, wheat crop very promising up to December 15th, when by hard wet freezes its leaves were turned to a rusty brown color; it is now well protected by the snow and an average crop is anticipated. *Bowen Co.*, 15th, the prospects are favorable for a good wheat crop; a full crop was sown. *Todd Co.*, 16th, wheat looking very well; it is deeply covered with snow; a good crop is expected. *Breckenridge Co.*, 16th, a very small acreage of wheat was sown here last fall, but it is looking well, and a rich harvest expected.

*Louisiana*—*Okalooska*, 31st, grass starting, leaf buds on rose bushes opening. *Maryland*—*Sandy Springs*, 3rd, hundreds of bushels of potatoes froze in cellars. *Mississippi*—*Brookhaven*, in bloom, 22nd, hyacinth, 29th, jonquils; leafing, 23rd, woodbine, 29th, spirea, 30th, flowering almond and blackberry; 23rd, strawberries ripe, but tasteless; *Fayette*, in bloom, 25th, daffodils, 30th, spirea. *Missouri*—*Oregon*, 26th, vegetables, grains, grasses and weeds, uncovered by the melting snow, were found to have been growing all winter. *Springfield*, 31st, buds of peach and raspberry reported killed; 29th, blue grass sprouting and quite green. *Louisiana*, 31st, buds of peach and apricot killed. *Lexington*, 31st, peach buds safe along the river, but reported entirely killed six miles from the river. *Nebraska*—*Genoa*, 30th, frost out of ground, farmers seeding spring grain. *Omaha*, 31st, grass growing through the grain stubble, willow and cottonwood trees budding. *North Carolina*—*Fayetteville*, budding, 15th, japonicas; 21st, swamp bilberry and spirea; 21st, hyacinth and crocus sprouting; 21st, violets in bloom throughout month in the open air. *Ohio*—*Tiffin*, 22nd, wheat crop considered safe, but peach trees, without doubt, killed entirely by the severe cold. *Lancaster*, 22nd, many acres of corn still in the shock; wheat in good condition, saved by heavy snow; peaches and other small fruits very severely injured, but with apples and pears it is more favorable; all but the hardiest species of grapes have been extensively injured. *Mansfield*, 22nd, wheat greatly benefitted by the heavy snow; peaches generally conceded to be killed. *Urbana*, 22nd, wheat doing nicely; apples in fine condition, but not so well with peaches. *Marysville*, 22nd, so far the winter remarkably favorable to the wheat crop; so far as can be ascertained, peaches and the earlier varieties of cherries are badly injured. *Franklin*, 22nd, wheat considered generally safe; peaches almost entirely destroyed; apples and pears still in pretty good condition. *Germantown*, 22nd, fruit raisers are uniform in the opinion that the present prospects are good for an average crop. *Adams Co.*, 22nd, wheat and grass well set and protected nicely by the heavy snow, prospects of a good crop; grapes and peaches very unfavorable; cherries, currants and plums not injured; apples in good condition; some fears expressed as to the pear crop. *Kenton*, *Hardin Co.*, 22nd, wheat crop saved by the heavy snow; apples, peaches, pears and cherries have all been killed. *Hamilton*, 22nd, prospects flattering for large crops of wheat and barley. *Cuyahoga Co.*, 22nd, much fear is expressed regarding the grain and grass crops, as the high winds have blown the fields bare in many places, exposing to the severe cold the tender roots of the plants; buds of the peach, pear and cherry are not far enough advanced yet to be subject to much injury. *Cadiz*, 22nd, wheat crop well protected by the snow; it is claimed by some that the peaches are all killed. *Oxford*, 24th, fruit is in all probability greatly injured. *New Philadelphia*, 23rd, it is the general opinion that the wheat crop is not injured, except, perhaps, in a few localities, on low, wet ground, where ice had formed. *Columbus*, 24th, weather very favorable to the wheat crop, it is well protected by the snow; peach buds are destroyed, and probably cherries and other small fruits; apples are uninjured. *Middletown*, 24th, wheat and barley well protected by the snow, and doing nicely; apples are not hurt, but it is believed that peaches are all killed, and many trees frozen to death; grapes and other small fruits are hurt some, but not all destroyed. *Gallipolis*, 22nd, wheat preserved from injury by the heavy snow; in some cases peaches reported killed and trees split open by the intense cold. *Chillicothe*, 23rd, wheat comparatively uninjured, the snow protecting the roots; peaches are almost entirely destroyed. *Greenfield*, 23rd, wheat crop very promising; barley safe. *Licking Co.*, 23rd, wheat and grass healthy and fresh, prospects of an abundant harvest; farmers and fruit growers express the opinion that the extremely low temperature has not only injured the fruit buds, but also the trees, especially the peach. *Coshooton Co.*, 23rd, wheat crop in good condition; it is the general opinion that fruit is not injured, except peaches, in some localities. *Eaton*, 24th, grapes and peaches are conceded to be almost entirely destroyed; wheat in a fine, green condition. *Dayton*, 24th, grain well protected by snow; peaches in some localities severely damaged; apples and plums somewhat affected. *Jackson*, 23rd, fruit comparatively safe; wheat well protected. *Fremont*, 23rd, wheat in splendid condition; peach and cherry buds killed; peach trees not much injured, but apple trees in some instances have burst. *Circleville*, 22nd, the more tender varieties of fruit—peaches, cherries, &c.—are killed; many house plants frozen. *Canton*, 23rd, peach trees are very generally killed by the frost, while apple trees have escaped untouched; wheat and grass are in good condition. *Barnesville*, 23rd, peach crop is considered destroyed, many of the trees have actually burst from the frost; wheat is looking fine, and a large crop is expected.

*Texas*—*Melissa*, 31st, very little farm work done during the month on account of cold, wet weather; farmers are now beginning to plow vigorously.

*West Virginia*—*Parkersburg*, 22nd, wheat crop uninjured; fruit crop considerably injured; peaches ruined and many trees killed. *Wheeling*, 23rd, wheat reported in excellent condition, and the largest crop ever known is predicted; fruit very little injured, except peaches; a very heavy crop of apples is anticipated.

*Wisconsin*—*Embarras*, 31st, winter grain suffering from severe cold.

**BIRDS.**—*Geese*.—St. Meinrad, Ind., 16th, flying N.; Somerset, Mass., 1st, S.; Corning, Mo., 3rd, Platts-mouth, Neb., 24th, SE.; Norfolk, Ohio, 2nd, SW.; Dover Mines, Va., 7th, S.; Independence, Ia., 22nd, 24th and 25th, N.; Emory Grove, Md., 28th, SE.; Oregon, Mo., 27th; Melissa, Tex., 28th and 30th; Sacramento, Cal., 26th; Ft. Sill, Ind. Ty., 30th; Ft. Gibson, Ind., Ty., 28th. *Crows*.—Monticello, Ia., 28th; Bethel, Ohio, 27th; Northport, Mich., 31st; Oregon, Mo., 30th; Ringgold, Ohio, 22nd, 23rd and 25th. *Chickadees*.—Rowe, Mass., 19th; Northport, Mich., 31st. *Robins*.—Elmira, Ill., 27th; Creswell, Kan., 27th and 29th; Fall River, Mass., 12th; Bethel, Ohio, 27th; Dover Mines, Va., 9th, immense flocks appeared; Broad Oak, Va., 2nd and 31st, large flocks; Wellsburg, West Va., 2nd; Nora Springs, Ia., 20th; Glasgow, Mo., 25th; Ringgold, Ohio, 25th and 29th; Ft. Gibson, Ind. Ty., 2nd, large flocks flying S. *Rice Birds*.—Uvalde, Tex., 17th. *Blue Birds*.—Platts-mouth, Neb., 24th; Weldon, N. C., 22nd; Bethel, Ohio, 28th; Broad Oak, Va., 31st, large flocks; Nora Springs, Ia., 30th; Glasgow, Mo., 28th; Ringgold, Ohio, 29th. *Sparrows*.—Monticello, Ia., 16th and 22nd. *Red Birds*.—Bethel, Ohio, 27th; Oregon, Mo., 20th to 22nd, 24th; Springfield, Mo., 24th. *Bluejays*.—Monticello, Ia., 15th, 21st; Rowe, Mass., 19th, 26th; Oregon, Mo., 18th; Springfield, Mo., 24th. *Winter Wrens*.—Fallston, Md., 25th. *Owls*.—Oregon, Mo., 6th, 27th. *Snow Birds*.—Monticello, Ia., 5th; Rowe, Mass., 6th, 14th, 20th; Emory Grave, Md., 8th, 24th; Oregon, Mo., 7th, 11th, 17th. *Eagles*.—Northport, Mich., 31st. *Waxwings*.—Rowe, Mass., 4th, 8th, 10th, 11th, 19th, 20th, 22nd, 24th, 25th, 30th. *Mocking birds*.—Weldon, N. C., 24th. *Ducks*.—Creswell, Kan., 7th, 13th, 20th, 22nd, 25th; Lebanon, Mo., 29th; Northport, Mich., 31st; Ft. Gibson, Ind., Ty., 8th.

**MISCELLANEOUS.**—*Frogs piping*.—Fort Barrancas, Fla., 23rd; Okalooska, La., 17th; Fayetteville, N. C., 24th; Fayette, Miss., 14th. *Bats*.—Uvalde, Tex., 28th. *Moths*.—Fayetteville, N. C., 24th to 28th. *Wasps*.—Fayette, Miss., 17th, 25th. *Black Bees*.—Fayetteville, N. C., 24 to 28th. *Lady Bugs*.—Independence, Iowa, 27th. *Lizards*.—Fayette, Miss., 29th. *Mosquitos*.—Okalooska, La., 29th. *Bees*.—Fayette, Miss., 28th, carrying pollen.

**Meteors.**—Anna, Ill., 18th, 27th; New Corydon, Ind., 16th, 22nd, 30th, 31st; Ft. Dodge, Ia., 7th, 22nd; Fallston, Md., 16th, 7:45 p. m., large meteor moving W. along the S. horizon, color of red-hot iron, motion horizontal, altitude 30°; Woodstock, Md., 1st, 14th, 18th, 21st, 22nd; Sandy Springs, Md., 11th; Rowe, Mass., 12th, 14th, 29th; Atco, N. J., 11th; Wappinger's Falls, N. Y., 10th, 20th, 22nd, 25th; Atlantic City, N. J., 20th, 10 p. m., very brilliant meteor, descended from a point 10° S. of zenith, no fragment or train of light were seen to follow in its course. Detroit, Mich., 25th; Ft. Pembina, Dak., 15th; Southington, Conn., 22nd; Iowa City, Ia., 29th; Thornville, Mich., 10th, Oregon, Mo., 12th, 17th, 18th, 21st; North Volney, N. Y., 24th; South Hartford, N. Y., 23rd; Jacksonburg, Ohio, 25th, 26th, 29th; Boise City, Idaho, 18th; Ft. Davies, Tex., 11th; Savannah, Ga., 14th, 29th; Charleston, 29th.

**Zodiacal Light.**—New Corydon, Ind., 3rd, 5th, 16th, 18th, 23rd, 24th, 28th, to 31st; Cresco, Ia., 12th, 16th, 17th, 19th, 23rd; Monticello, Ia., 9th, 12th, 17th, 18th, evenings; Topeka, Kan., 11th; Orouo, Me., 10th, 14th, 23rd, evenings; Somerset, Mass., 10th, 13th, 14th, 18th, 20th, 22nd, 23d, 24th, evenings; Corning, Mo., 18th; Atco, N. J., 10th, 13th, 14th, 18th to 23rd, evenings; Princeton, N. J., 16th, 23rd; Waterburg, N. Y., 12th, 13th, 18th, 23rd; Bellefontaine, Ohio, 16th, 19th, 20th, 21st, 23rd, 25th; Wytheville, Va., 11th, 13th, 19th, 21st, 22nd, 23rd, 25th; Rowe, Mass., 12th; Southampton, Conn., 18th, 22nd, 23rd; Olivet, Tak., 15th to 31st; Iowa City, Ia., 12th; Okalooska, La., 19th and 20th; Cambridge, Mass., regularly looked for at 8 p. m., and distinctly seen on the 12th, 13th, 18th, 20th, 23rd, visible through haze or among clouds at about 6:30 p. m., on the 14th, 16th, 19th, visible or suspected in moonlight on the 10th, 25th, observations on other evenings hindered by strong moonlight or clouds; Oregon, Mo., 11th to 13th, 16th to 25th; New Ulm, Tex., 23rd; Savannah, Ga., 10th, 13th, 14th, 19th, 20th, 21st, 24th, evenings; Newbury, Vt., 10th, 14th, 15th, 16th, 23rd, evening. Looked for regularly before sunrise and after sunset at Mount Washington, but none observed, and at Pike's Peak but observed only on 26th, evening.

**Polar Bands.**—New Corydon, Ind., 5th, 6th, 10th, 18th, 20th, 24th, 25th, 28th, 30th. West Waterville, Me., 1st, 2nd, 4th. Wytheville, Va., 3rd, 7th, 11th, 13th, 15th, 17th, 20th, 26th, 30th. Nirvana, Mich., 24th. Woodstock, Vt., 7th, 17th, 19th.

**Prairie Fires.**—North Platte, Neb., 24th to 26th; Independence, Ia., 29th; Fort Sill, Ind. Ty., 22d; Eagle Pass, Tex., 15th, 16th; Brackettsville, Tex., 17th, 19th; New Orleans, La., 3d, 17th, 26th.

**Earthquakes.**—November, U. S. Naval Hospital, Yokahama, Japan, 22nd, 11:12 p. m., heavy shock lasting one minute; 11:21 p. m., light shock; 26th, light shock lasting twenty seconds. December 17th, at Yuma, Arizona, 4 p. m., slight shock, lasting eight seconds, perceptibly shaking buildings; and at Campo, Cal., 4.03 p. m., two very slight shocks, lasting about two seconds, motion from the SW., accompanied by a low rumbling noise. January, Arequipa, Peru, 9th, 11:15 p. m., a most severe shock. Iquique, Peru, 12th, about midnight long and violent shock accompanied by curious subterranean noise. On the 12th, in Fla., at Jacksonville, 11.40 p. m., two distinct shocks, lasting about 30 seconds; motion from NW. to SE.; some persons reported a slight rumbling noise accompanying the shocks; houses all over the city were felt to move; the telegraph operator at Lake City reports the shock as felt there almost simultaneous with Jacksonville; at Mayport observer states that all his household were awakened by the rattling of the doors and windows; a sort of undulatory motion of the house was only perceptible; at Gulf Hammock, 11.55 p. m., slight shock, a sudden impulse followed by a few vibrations; at Daytona, 11.50 p. m., "a violent shaking and a loud rumbling noise as if an approaching train of cars, then as if they jumped the rails and ran over the sleepers for a few seconds; clocks stopped and people were awakened and terribly frightened; direction probably from east to west; duration, four to six seconds. At Okahumpka, Fla., 12 p. m., observer states that he felt a shock, direction NNW. to SSE., lasting at least one minute, accompanied by a peculiar buzzing sound; vibrations of sufficient force to slightly rock his house, rattling glasses, dishes, &c., on the shelves. St. Francis Barracks,

St. Augustine, Fla., 13th, 11:55 p. m., two almost imperceptible tremblings were experienced, lasting about two seconds, with the same intervals of rest; these were followed by a rapid vibratory motion, apparently from east to west, lasting two or three seconds; in the small and weaker houses of the town small objects were thrown from shelves by the shock; plaster was detached from the walls of houses in several places; the sentry on post reports hearing at the time a heavy explosion as of a distant torpedo at sea.

*Sunsets.*—The characteristics of the sky at sunset, as indications of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Corps Stations. Reports from 117 stations show 3,597 observations to have been made, of which 39 were reported doubtful; of the remainder 2,921, or 81.2 per cent. were followed by the expected weather.

*Sun Spots.*—The following monthly record of observations by Mr. D. P. Todd, Nautical Almanac office, Washington, D. C., is communicated by Prof. S. Newcomb, U. S. Navy, in charge of that office:

JANUARY 1879.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Remarks.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
2nd, 2 p. m...	1	2	0	0	0	0	1	2	Small group of faculæ.
" 3 p. m...	0	0	0	0	0	0	1	2	
4th, 3 p. m...	0	0	1	2	0	0	0	0	
7th, 2 p. m...	0	0	0	0	0	0	0	0	
13th, 3 p. m...	0	0	0	0	0	0	0	0	
14th, 3 p. m...	0	0	0	0	0	0	0	0	
16th, 2 p. m...	0	0	0	0	0	0	0	0	
18th, 2 p. m...	0	0	0	0	0	0	0	0	
20th, 2 p. m...	0	0	0	0	0	0	0	0	
21th, 3 p. m...	0	0	0	0	0	0	0	0	
23rd, 4 p. m...	0	0	0	0	0	0	0	0	
25th, 2 p. m...	0	0	0	0	0	0	0	0	
27th, 2 p. m...	0	0	0	0	0	0	0	0	
29th, 3 p. m...	0	0	0	0	0	0	0	0	

Mr. Jay Harcourt, at Wappinger's Falls, N. Y., examined the sun on the following days, but observed no spots: 6th, 7th, 12th, 14th, 18th to 20th, 22nd, 25th, 26th, 29th, 30th, 31st. Mr. David Trowbridge, at Waterburg, N. Y., examined the sun on the following days, but observed no spots: 1st, 11th to 13th, 17th, 22nd, 24th to 26th, 28th to 31st. Mr. William Dawson, at Spiceland, Ind., examined the sun on the following days, but observed no spots: 18th, 21st, 26th, 28th, on the 30th one group was seen with two spots. Prof. G. Hinrichs at Iowa City, Ia., examined the sun on twenty days, no spots seen. Observations were also continued daily at Fort Whipple, Va., but no spots observed.

## NOTES AND EXTRACTS.

*Atmospheric Electricity.*—In *Nature* for January 2d is given a report on the observations of atmospheric electricity made seven times a day at Montsouris. It is stated that during a recent long continuance of high pressure, and with a variety of cold and unpleasant weathers, the indications were invariably of positive electricity; that the change to negative electricity took place simultaneously with the change to warmer, thawing weather. At page 220, January 9th, it states that the electric indications at Kew were the same as at Montsouris.

*Clouds and Weather.*—The following extracts are from a lecture by W. C. Ley, on clouds and weather-signs, (*Nature*, 1878, page 178):

"As regards configuration, clouds seem naturally divisible into two groups, those which arrange themselves in layers, whose vertical diameter is small as compared with its horizontal, and those which assume spherical or hemispherical shapes; and this division is related to certain physical conditions of the atmosphere and of the earth's surface beneath the cloud. It is, however, essential that we should possess some name or system of names to distinguish those clouds which are conveyed by the upper currents, and the term cirrus, with its compounds, must be more closely restricted to this class of clouds than has yet been done. From the use of weather-maps a new science of the winds has originated, on which all attempts at weather forecasting must be based. The movements of the upper clouds afford most valuable information concerning the distribution and movement of the areas of high and low barometric pressure. Rules by which this information may be interpreted, based in great measure on a former investigation by the lecturer,<sup>1</sup> are somewhat complex, and cannot well be given in a brief *résumé* like the present.<sup>2</sup> It may be sufficient to explain that in the front of an advancing barometric depression there usually extends a bank of the halo-producing cirro-stratus, the exterior edge of which is, roughly speaking, a parabola, the focus of which lies in the line about to be traversed by the centre of the depression. On the right-hand of the centre this bank or sheet is abruptly broken and is succeeded in the rear by local shower-clouds. On the left-hand the sky commonly continues overcast, but the cloud-plane gradually descends until little is to be seen but low stratus. A backing of the upper current takes place until after the centre of the depression has passed. In whatever direction a depression is advancing the same characteristic phenomena are observed. Thus changes in the clouds indicate to us probable alterations of wind and weather."

"While the nimbus, which exists in the front of a depression, first makes its approach evident by changes in the higher cloud-strata, the process of nubification is the converse of this in those local showers which commonly occur on the right-hand and in the rear of a centre of depression, and therefore when the baro-